

Appl. No. 10/021,216
Reply to Office Action of December 2, 2004

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Original) A method for manufacturing an ink-jet print head in which ink channels are formed on a member including a piezoelectric body, and ink is jetted from each of the ink channels by applying a voltage to electrodes provided on the piezoelectric body according to each of the ink channels thereby driving the piezoelectric body, the method comprising the steps of:

plating a surface of a channel plate having a plurality of grooves for the ink channels thereby forming a thin-film plating layer which is thinner than a desired thickness;

removing a part of the thin-film plating layer by a laser beam; and

plating again the channel plate thereby forming an additional plating layer on the thin-film plating which has not been removed by the laser beam, and thereby forming the electrodes of the desired thickness.

Appl. No. 10/021,216
Reply to Office Action of December 2, 2004

2. (Original) The method of claim 1, wherein the electrodes are made of nickel or copper.

3. (Withdrawn) A method for manufacturing an ink-jet print head in which ink channels are formed on a member including a piezoelectric body, and ink is jetted from each of the ink channels by applying a voltage to electrodes provided on the piezoelectric body according to each of the ink channels thereby driving the piezoelectric body, the method comprising the steps of:

adsorbing a catalyst onto a channel plate having a plurality of grooves for the ink channels;

removing a part of the catalyst by a laser beam; and

plating at least one side surface and a bottom surface of the channel plate, thereby forming a plating layer serving as the electrodes on the catalyst which has not been removed by the laser beam.

4. (Withdrawn) A method for manufacturing an ink-jet print head in which ink channels are formed on a member including a piezoelectric body, and ink is jetted from each of the ink

Appl. No. 10/021,216
Reply to Office Action of December 2, 2004

channels by applying a voltage to electrodes provided on the piezoelectric body thereby driving the piezoelectric body according to each of the ink channels, the method comprising the steps of:

adhering a channel plate having a plurality of grooves for the ink channels and a cover plate together, thereby forming a print head chip;

forming a plating layer serving as the electrodes on both inside and outside of each of a plurality of pipe-shaped channels, which have been formed on the print head chip for the ink channels; and

removing a part of a plating layer formed on an outside surface of the print head chip by a laser beam, thereby forming the electrodes inside the pipe-shaped channels and on an outside surface of the print head chip.

5. (Withdrawn) The method of claim 4, wherein the plating layer formed as the electrodes have a plating layer thickness thinner than a desired thickness, and the method further comprises the step of plating again the inside of each of the plurality of pipe-shaped channels and the outside surface of the print head

Appl. No. 10/021,216
Reply to Office Action of December 2, 2004

chip after the step of the removing the part of the thin-film of the plating layer by the laser beam, thereby forming an additional plating layer on the thin-film of the plating layer which has not been removed by the laser beam.

6. (Withdrawn) The method of claim 4, wherein the electrodes are made of nickel or copper.

7. (Withdrawn) A method for manufacturing an ink-jet print head in which ink channels are formed on a member including a piezoelectric body, and ink is jetted from each of the ink channels by applying a voltage to electrodes provided on the piezoelectric body thereby driving the piezoelectric body according to each of the ink channels, the method comprising the steps of:

adhering a channel plate having a plurality of grooves for the ink channels and a cover plate together, thereby forming a print head chip;

adsorbing a catalyst on the print head chip;

removing a part of the catalyst formed on an outside surface of the print head chip by a laser beam; and

Appl. No. 10/021,216
Reply to Office Action of December 2, 2004

plating an inner wall of each of the plurality of the ink channels and the outside surface of the print head chip, thereby forming a plating layer serving as the electrodes, on the catalyst which has not been removed by the laser beam.

8. (New) The method of claim 1, wherein a thickness of thin-film plating layer is not more than 0.5 μm .

9. (New) The method of claim 1, wherein the head substrate is plated by an electroless plating.

10. (New) A method for manufacturing an ink-jet print head in which ink channels are formed on a member including a piezoelectric body, and ink is jetted from each of the ink channels by applying a voltage to electrodes provided on the piezoelectric body according to each of the ink channels thereby driving the piezoelectric body, the method comprising the steps of:

providing a catalyst on a surface of the channel plate having a plurality of grooves:

Appl. No. 10/021,216
Reply to Office Action of December 2, 2004

plating the channel plate provided with the catalyst to form a first plating layer having a first thickness on the catalyst;

removing a part of the first plating layer along with the catalyst on which the removed part was plated, using a laser beam; and, thereafter,

plating the channel plate to form a second plating layer having a second thickness which is thicker than the first thickness, on the first plating layer which has not been removed by the laser beam.

11. (New) The method of claim 10, wherein the laser beam removes the first plating layer and the catalyst along the plurality of grooves.

12. (New) The method of claim 10, wherein the first thickness is not more than 0.5 μm .

13. (New) The method of claim 10, wherein the head substrate is plated by an electroless plating.